<u>AMENDMENTS TO THE CLAIMS</u>

This listing of claims will replace all prior versions and listings of claims in the application.

1   1.   (Previously Presented) A method of selecting a heuristic class for data placement

2   in a distributed storage system comprising the steps of:

3   forming an integer program for each of a plurality of heuristic classes,

4   each of the heuristic classes providing a technique for placing data within the

5   distributed storage system, each of the integer programs comprising an

6   objective of minimizing a replication cost for placing the data;

7   solving each of the integer programs which provide the replication cost for

8   each of the heuristic classes; and

9   selecting the heuristic class having a low replication cost.

1   2.   (Previously Presented) A method of selecting a heuristic class for data placement

2   in a distributed storage system comprising the steps of:

3   forming a general integer program which models placing data within the

4   distributed storage system;

5   forming a specific integer program which models a heuristic class that

6   provides a technique for placing the data within the distributed storage system,

7   the general and specific integer programs each comprising an objective of

8   minimizing a replication cost for placing the data;

9   solving the general integer program which provides a general lower bound

10   for the replication cost;

11   solving the specific integer program which provides a specific lower

12   bound for the replication cost; and

13   selecting the heuristic class if a difference between the general lower

14   bound and the specific lower bound is within an allowable amount.

1   3.   (Original) The method of claim 2 wherein inputs used in the steps of forming the

2   general and specific integer programs comprise a system configuration, a workload,

3   and a performance requirement.

1   4.   (Original) The method of claim 3 wherein the performance requirement comprises
2   a bi-modal performance metric.

1   5.   (Original) The method of claim 4 wherein the bi-modal performance metric
2   comprises a criterion and a ratio of successful attempts to total attempts.

1   6.   (Original) The method of claim 3 wherein the performance requirement comprises
2   a data access latency.

1   7.   (Original) The method of claim 3 wherein the performance requirement comprises
2   a data access bandwidth.

1   8.   (Original) The method of claim 3 wherein the performance requirement comprises
2   a data update time.

1   9.   (Original) The method of claim 3 wherein the performance requirement comprises
2   an average data access latency.

1   10.   (Original) The method of claim 3 wherein the performance requirement comprises
2   a data availability requirement.

1   11.   (Original) The method of claim 3 wherein the general integer program comprises
2   general constraints which model the data placement irrespective of the heuristic class
3   for the data placement.

1   12.   (Original) The method of claim 11 wherein the general constraints comprise a
2   performance constraint which models the performance requirement.

1   13.   (Original) The method of claim 11 wherein the specific integer program

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2   comprises the general constraints and a specific constraint.

1   14.   (Original) The method of claim 12 wherein the specific constraint comprises a

2   storage constraint.

1   15.   (Original) The method of claim 12 wherein the specific constraint comprises a

2   replica constraint.

1   16.   (Original) The method of claim 12 wherein the specific constraint comprises a

2   routing knowledge constraint and further wherein the routing knowledge constraint

3   models an extent to which a data storage node knows of replicas of data objects

4   stored on other data storage nodes.

1   17.   (Original) The method of claim 12 wherein the specific constraint comprises an

2   access knowledge constraint and further wherein the access knowledge constraint

3   models an extent to which a data storage knows of access to replicas of data objects

4   by clients accessing other data storage nodes.

1   18.   (Original) The method of claim 12 wherein the specific constraint comprises an

2   activity history constraint.

1   19.   (Original) The method of claim 12 wherein the specific constraint comprises a

2   reactive placement constraint.

1   20.   (Original) The method of claim 3 wherein the system configuration comprises a

2   plurality of data storage nodes coupled by a plurality of network links.

1   21.   (Original) The method of claim 20 wherein the system configuration further

2   comprises a plurality of clients coupled to the data storage nodes.

1   22.   (Original) The method of claim 21 wherein the workload comprises at least some

2   of the clients requesting data objects stored on the data storage nodes.

1   23.   (Original) The method of claim 22 wherein the workload further comprises at
2   least some of the clients storing some of the data objects on the data storage nodes.

1   24.   (Previously Presented) A method of selecting a heuristic class for data placement
2   in a distributed storage system comprising the steps of:
3   forming a general integer program which models placing data within the
4   distributed storage system;
5   forming a plurality of specific integer programs which model a plurality of
6   heuristic classes, each of the heuristic classes providing a technique for
7   placing the data within the distributed storage system, the general and specific
8   integer programs each comprising an objective of minimizing a replication
9   cost for placing the data;
10   solving the general integer program which provides a lower bound for the
11   replication cost;
12   solving the specific integer programs which provides the replication cost
13   for each of the heuristic classes; and
14   selecting a particular heuristic class correlated to a low replication cost if a
15   difference between the lower bound and the low replication cost is within an
16   allowable amount.

1   25.   (Previously Presented) A computer readable memory comprising computer code
2   for implementing a method of selecting a heuristic class for data placement in a
3   distributed storage system, the method of selecting the heuristic class comprising the
4   steps of:
5   forming an integer program for each of a plurality of heuristic classes,
6   each of the heuristic classes providing a technique for placing the data within
7   the distributed storage system, each of the integer programs comprising an
8   objective of minimizing a replication cost for placing the data;
9   solving each of the integer programs which provide the replication cost for

10   each of the heuristic classes; and

11   selecting the heuristic class having a low replication cost.

1   26.   (Previously Presented) A computer readable memory comprising computer code

2   for implementing a method of selecting a heuristic class for data placement in a

3   distributed storage system, the method of selecting the heuristic class comprising the

4   steps of:

5   forming a general integer program which models placing data within the

6   distributed storage system;

7   forming a specific integer program which models a heuristic class that

8   provides a technique for placing the data within the distributed storage system,

9   the general and specific integer programs each comprising an objective of

10   minimizing a replication cost for placing the data;

11   solving the general integer program which provides a general lower bound

12   for the replication cost;

13   solving the specific integer program which provides a specific lower

14   bound for the replication cost; and

15   selecting the heuristic class if a difference between the general lower

16   bound and the specific lower bound is within an allowable amount.

1   27.   (Previously Presented) A computer readable memory comprising computer code

2   for implementing a method of selecting a heuristic class for data placement in a

3   distributed storage system, the method of selecting the heuristic class comprising the

4   steps of:

5   forming a general integer program which models placing the data within

6   the distributed storage system;

7   forming a plurality of specific integer programs which model a plurality of

8   heuristic classes, each of the heuristic classes providing a technique for

9   placing the data within the distributed storage system, the general and specific

10   integer programs each comprising an objective of minimizing a replication

11   cost for placing the data;

12   solving the general integer program which provides a lower bound for the

13   replication cost;

14   solving the specific integer programs which provides the replication cost

15   for each of the heuristic classes; and

16   selecting a particular heuristic class correlated to a low replication cost if a

17   difference between the lower bound and the low replication cost is within an

18   allowable amount.